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DIAGNOSTIC PERFORMANCE OF NEUTROPHIL-TO-LYMPHOCYTE RATIO AND PLATELET-TO-LYMPHOCYTE RATIO IN SEPSIS – A Hospital-Based Comparative Study from a Tertiary Care Teaching Hospital in South India

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Abstract: Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection and remains a major cause of hospital morbidity and mortality. Rapid, inexpensive and widely available markers may support early clinical assessment, particularly in resource-limited settings where dedicated biomarker assays may not be routinely accessible. The neutrophil-to-lymphocyte ratio (NLR) and the platelet-to-lymphocyte ratio (PLR), both derived from a routine complete blood count, have been investigated as composite indices of the inflammatory and thrombo-inflammatory response.

Objective: To evaluate and compare the diagnostic performance of NLR and PLR, individually and in combination, in distinguishing adult patients with sepsis from non-septic controls, and to examine their relationship with qSOFA category.

Methods: A hospital-based comparative observational study was carried out on 145 adult participants, comprising 105 patients fulfilling Sepsis-3 criteria and 40 non-septic controls. Absolute neutrophil, lymphocyte and platelet counts were obtained from a complete blood count with differential collected within 24 hours of sepsis onset or admission. NLR and PLR were calculated. Groups were compared using the independent-samples t-test and chi-square/Fisher's exact tests. Pearson/point-biserial correlation, an exploratory binary logistic regression model, and receiver operating characteristic (ROC) curve analysis were used to assess associations and discrimination, with optimal cut-offs identified by the Youden index.

Results: Absolute neutrophil count, platelet count, NLR and PLR were all significantly higher in the sepsis group, whereas the absolute lymphocyte count did not differ significantly between groups ($p=0.341$). Mean NLR was 4.185 ± 1.027 in sepsis versus 2.017 ± 0.116 in controls, and mean PLR was 215.091 ± 27.219 versus 167.386 ± 12.990 (both $p<0.001$). NLR showed an AUC of 0.991 (95% CI 0.959–1.000); at a cut-off of >2.3 it achieved 99.05% sensitivity and 100.00% specificity. PLR yielded an AUC of 0.955 (95% CI 0.908–0.983), with 92.38% sensitivity and 100.00% specificity at a cut-off of >200. An exploratory combined NLR–PLR regression-derived index yielded an AUC of 0.985. Neither ratio differed significantly across qSOFA categories.

Conclusion: NLR and PLR were significantly higher in septic than non-septic participants in this cohort. NLR demonstrated a numerically higher AUC than PLR in this cohort. The exploratory combined NLR–PLR index did not improve discrimination beyond NLR alone. Neither ratio was significantly associated with qSOFA category. These findings support further prospective evaluation of NLR and PLR as adjunctive laboratory markers; they should not be used as stand-alone tests for diagnosing or excluding sepsis.

Index Terms *- Sepsis; neutrophil-to-lymphocyte ratio; platelet-to-lymphocyte ratio; complete blood count; ROC analysis; qSOFA; biomarkers.*

I. INTRODUCTION

Sepsis is defined by the Third International Consensus Definitions (Sepsis-3) as life-threatening organ dysfunction caused by a dysregulated host response to infection, with septic shock representing a subset characterised by profound circulatory, cellular and metabolic abnormalities and a substantially higher risk of death. Sepsis continues to impose a substantial global burden, with a particularly important impact in resource-constrained settings. [1,2,4]

Early recognition of sepsis is clinically challenging because its manifestations overlap with non-infectious systemic inflammation and other acute illnesses. Microbiological cultures may require substantial turnaround time and may be negative despite infection. Specialised biomarkers such as procalcitonin and other inflammatory biomarkers have been studied extensively, but their availability, cost and turnaround time may limit use in some settings. [2,3]

Against this background, composite indices derived from the complete blood count (CBC) have attracted considerable interest. The neutrophil-to-lymphocyte ratio (NLR) is calculated as the absolute neutrophil count divided by the absolute lymphocyte count, and the platelet-to-lymphocyte ratio (PLR) as the absolute platelet count divided by the absolute lymphocyte count. Both can be calculated from routinely obtained CBC parameters without requiring a dedicated biomarker assay or additional blood sampling. [3,12]

The biological rationale for these indices relates to changes in circulating neutrophils, lymphocytes and platelets during systemic inflammation. NLR may reflect the balance between innate inflammatory activation and lymphocyte depletion, whereas PLR incorporates platelet activation or count changes with the lymphocyte response. CBC-derived indices are inexpensive and rapidly available, but they are nonspecific and must be interpreted in the clinical context. [5,9,12]

The published evidence is heterogeneous. Reported NLR cut-offs and diagnostic or prognostic performance vary according to the study population, sampling time point, comparator group and sepsis definition. Much of the existing literature has focused on prognosis rather than the diagnostic question of distinguishing septic from non-septic patients. The present study was therefore designed to evaluate the diagnostic discrimination of NLR and PLR, individually and in combination, between adult patients with sepsis and non-septic controls in a tertiary care teaching hospital, and to examine their relationship with qSOFA category. [6,9,12]

1.1 Aims and Objectives

The primary objective was to compare NLR and PLR between adult patients with sepsis and non-septic controls. The secondary objectives were: (i) to determine the diagnostic discrimination of NLR and PLR using ROC curve analysis and identify optimal cut-off values; (ii) to assess whether an exploratory combination of the two ratios improves discrimination over either ratio alone; and (iii) to examine the relationship between NLR, PLR and qSOFA category. [1,3]

II. REVIEW OF LITERATURE

Liu and colleagues, in a prospective observational study of patients with sepsis, reported that admission NLR was associated with disease severity and outcome, supporting its potential role as an adjunctive prognostic marker. Subsequent studies have reported elevated NLR in sepsis, although the magnitude of elevation and optimal cut-offs have varied between cohorts. [5]

A 2024 meta-analysis by Wu and colleagues found that NLR has prognostic value for mortality in adult sepsis, while also highlighting heterogeneity across studies. Liu and colleagues, in a study evaluating NLR and plasma lactate, reported an NLR cut-off of 14.08 for prediction of 28-day mortality, with sensitivity of 78.3% and specificity of 50%. These findings illustrate that prognostic cut-offs within septic cohorts should not be assumed to apply to diagnostic discrimination between septic and non-septic populations. [6,7]

The evidence for PLR is more mixed. Shen and colleagues reported an interaction between PLR and disease severity in relation to mortality, while a systematic review and meta-analysis by Wang and colleagues found an association between PLR and mortality but substantial between-study heterogeneity. Platelet counts may change over the course of sepsis, so PLR may vary according to the timing and clinical context of sampling. [8,9]

More recent work has explored composite inflammatory indices. Zhang and colleagues evaluated a combination of NLR and neutrophil-to-platelet ratio for prognostic prediction in sepsis, while Liu and colleagues evaluated NLR combined with interleukin-6 for 28-day mortality prediction. These studies are conceptually related to the present work but address prognosis rather than diagnostic discrimination and use different composite measures. Comparatively few studies have formally evaluated whether combining NLR and PLR improves diagnostic discrimination. [10,11]

III. MATERIALS AND METHODS

3.1 Study Design and Setting

This was a hospital-based comparative observational study conducted in the Department of Pathology, in collaboration with the emergency department and the medical and surgical intensive care units, of Swamy Vivekananda Medical College Hospital and Research Institute, a tertiary care teaching hospital in Namakkal, India. The study was carried out over a period of 6 months from March, 2026 to August, 2026. The manuscript was prepared with reference to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement for observational studies. [15]

3.2 Study Population

A total of 145 adult participants were enrolled, comprising 105 patients in the sepsis group and 40 participants in the non-septic control group.

Inclusion criteria for the sepsis group were: age 18 years or above; suspected or documented infection with acute organ dysfunction meeting Sepsis-3 criteria; availability of a complete blood count with differential obtained within 24 hours of sepsis onset or admission; and written informed consent from the participant or a legally authorised representative. [1]

The control group comprised age- and sex-comparable adult participants admitted to the same institution during the study period who did not meet Sepsis-3 criteria and had no clinical or laboratory evidence of acute systemic infection or organ dysfunction.

Exclusion criteria applied to both groups were: known haematological malignancy, myeloproliferative or myelodysplastic disorder, or active chemotherapy or radiotherapy within the preceding four weeks; chronic immunosuppressive therapy, including long-term corticosteroids, biologic agents or transplant immunosuppression, and HIV infection with a CD4 count below 200 cells/µL; active autoimmune or chronic inflammatory disease likely to independently alter the leucocyte differential; pregnancy; death or discharge within 24 hours of admission precluding sampling; and prior splenectomy or known chronic thrombocytopenia or thrombocytosis of non-septic aetiology.

3.3 Data Collection and Laboratory Methods

Demographic details, presenting complaints, suspected source of infection and relevant comorbidities were recorded on a structured proforma. Clinical risk stratification in the sepsis group was assessed using the qSOFA score, comprising respiratory rate ≥22 breaths per minute, altered mentation, and systolic blood pressure ≤100 mmHg, each scored as one point. [14]

EDTA anticoagulated venous blood was collected for sepsis as a routine protocol. This was examined within 6 hours after collection. Absolute neutrophil count, absolute lymphocyte count and platelet count were analysed in a 5-part automated haematology analyser, according to the manufacturer's standard operating procedure. Peripheral smear was examined when there was a indication to verify automated differential counts. NLR and PLR were calculated as follows:

NLR = Absolute Neutrophil Count ÷ Absolute Lymphocyte Count

PLR = Absolute Platelet Count ÷ Absolute Lymphocyte Count

3.4 Statistical Analysis

Data were tabulated in Microsoft Excel and analysed using SPSS version 32. Continuous variables are summarised as mean ± standard deviation and categorical variables as frequencies and percentages. The distribution of continuous variables was assessed before parametric testing. Comparison of continuous variables between the sepsis and control groups was performed using the independent-sample t-test, and categorical variables were compared using Pearson's chi-square test with Fisher's exact test applied when expected cell counts were small. One-way analysis of variance was used to compare NLR and PLR across qSOFA categories.

The strength of association between sepsis classification, NLR and PLR were assessed using Pearson's correlation coefficient (equivalent to a point-biserial correlation when one variable is binary). An exploratory binary, logistic regression model was constructed with sepsis classification as the dependent variable and NLR and PLR as predictors, generating a combined predicted value.

3.5 Ethical Considerations

The study protocol was conducted after obtaining Institutional Ethics Committee approval of Swamy Vivekananda Medical College Hospital and Research Institute, Namakkal, India. and was conducted in accordance with the Declaration of Helsinki. Written understandable informed consent was obtained from all participants of the study. Since NLR and PLR are derived from a complete blood count performed as part of standard clinical care, no additional venipuncture was required. All participant data were anonymised and stored safely.

IV. RESULTS

4.1 Baseline Characteristics

A total of 145 participants were studied, of whom 105 (72.4%) were in the sepsis group and 40 (27.6%) in the control group. The two groups were comparable with respect to sex distribution, with males constituting 54.3% of the sepsis group and 55.0% of the control group (χ^2=0.006, df=1, p=0.938). Participants in the sepsis group were on average approximately three and a half years older than controls, a difference that was statistically significant (p=0.003). Baseline characteristics and haematological parameters are presented in Table 1.

Table 1: Comparison of demographic and haematological parameters between sepsis and control groups

Variable	Sepsis (n=105)	Control (n=40)	Mean difference	p-value
Age (years)	48.276 ± 6.796	44.775 ± 4.790	3.501	0.003
Male, n (%)	57 (54.3)	22 (55.0)	—	0.938
Female, n (%)	48 (45.7)	18 (45.0)	—	0.938
Absolute neutrophil count (/µL)	8333.333 ± 621.980	4032.500 ± 934.630	4300.833	<0.001
Absolute lymphocyte count (/µL)	2099.048 ± 526.690	2007.500 ± 483.780	91.548	0.341
Platelet count (/µL)	440771.429 ± 82663.388	331750.000 ± 73053.809	109021.429	<0.001
NLR	4.185 ± 1.027	2.017 ± 0.116	2.168	<0.001
PLR	215.091 ± 27.219	167.386 ± 12.990	47.706	<0.001

Values are expressed as mean ± standard deviation unless otherwise stated. Continuous variables were compared using the independent-samples t-test; sex distribution was compared using Pearson's chi-square test (Fisher's exact p=1.000). NLR = neutrophil-to-lymphocyte ratio; PLR = platelet-to-lymphocyte ratio.

Absolute neutrophil count, platelet count, NLR and PLR were all significantly higher in the sepsis group. Notably, the absolute lymphocyte count did not differ significantly between the two groups (p=0.341), indicating that the elevation of both ratios in this cohort was driven predominantly by the numerator — neutrophilia in the case of NLR and thrombocytosis in the case of PLR — rather than by lymphopenia. The distribution of both ratios by study group is shown in Figure 1.

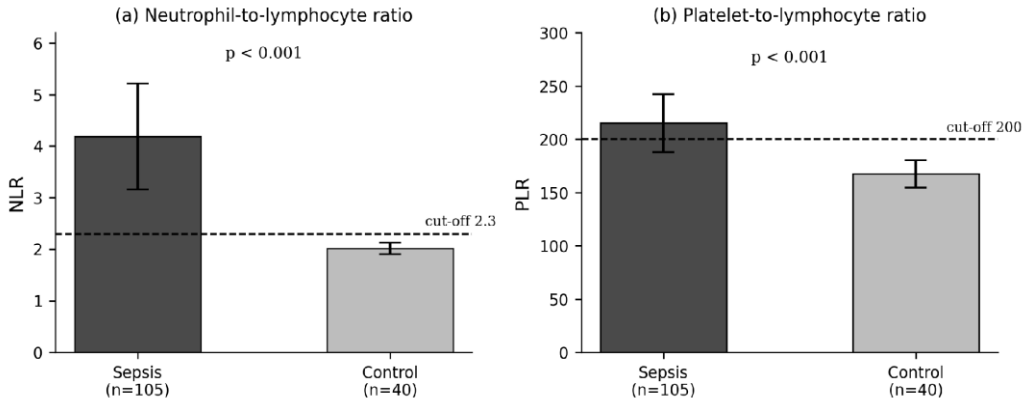

Fig. 1: Comparison of (a) neutrophil-to-lymphocyte ratio and (b) platelet-to-lymphocyte ratio between the sepsis and control groups. Bars represent mean values and error bars represent one standard deviation. Dashed lines indicate the ROC-derived optimal cut-off values.

4.2 qSOFA Category in the Sepsis Group

Within the sepsis group, 67 participants (63.8%) had a qSOFA score of 1, while 38 participants (36.2%) had a qSOFA score of 2 or 3. The relationship between the two ratios and qSOFA category is presented in Table 2.

Table 2: Comparison of NLR and PLR according to qSOFA category within the sepsis group

Variable	qSOFA category	n	Mean ± SD	F	p-value
NLR	qSOFA 1	67	4.332 ± 1.192	3.909	0.051
	qSOFA 2–3	38	3.925 ± 0.568		
	Total	105	4.185 ± 1.027		
PLR	qSOFA 1	67	215.518 ± 30.113	0.045	0.832
	qSOFA 2–3	38	214.338 ± 21.541		
	Total	105	215.091 ± 27.219		

One-way analysis of variance was used. qSOFA = quick Sequential Organ Failure Assessment; NLR = neutrophil-to-lymphocyte ratio; PLR = platelet-to-lymphocyte ratio.

Neither ratio differed significantly across qSOFA categories. NLR was numerically lower in participants with qSOFA 2–3 than in those with qSOFA 1, but the difference did not attain conventional statistical significance ($F=3.909$, $p=0.051$). PLR values were essentially identical across the two categories ($F=0.045$, $p=0.832$).

4.3 Correlation and Regression Analysis

Pearson correlation coefficients between sepsis classification, NLR and PLR are shown in Table 3. Sepsis classification correlated strongly and positively with both NLR ($r=0.743$) and PLR ($r=0.664$), and the two ratios were themselves strongly intercorrelated ($r=0.750$). All correlations were statistically significant at $p<0.001$.

Table 3: Correlation matrix of sepsis classification, NLR and PLR

Variable	Sepsis classification	NLR	PLR
Sepsis classification	1.000	0.743	0.664
NLR	0.743	1.000	0.750
PLR	0.664	0.750	1.000

Pearson correlation coefficients. All reported correlations were statistically significant at p<0.001. NLR = neutrophil-to-lymphocyte ratio; PLR = platelet-to-lymphocyte ratio.

An exploratory binary logistic regression regression model with sepsis classification as the dependent variable and NLR and PLR as predictors was statistically significant and explained 57.9% of the variance in the binary outcome ($R=0.761$; $R^2=0.579$; adjusted $R^2=0.573$; $F=97.474$, $p<0.001$).

Table 4: Summary of the binary logistic regression model for sepsis classification

R	R^2	Adjusted R^2	Std. error of estimate	F	p-value
0.761	0.579	0.573	0.293	97.474	<0.001

Dependent variable: sepsis classification. Predictors: NLR and PLR.

Table 5: Regression coefficients for the prediction of sepsis classification

Predictor	B	SE	Standardised β	t	p-value	95% CI for B	VIF
Constant	-0.650	0.171	—	-3.800	<0.001	-0.988 to -0.312	—
NLR	0.192	0.028	0.561	6.814	<0.001	0.137 to 0.248	2.283
PLR	0.003	0.001	0.243	2.957	0.004	0.001 to 0.006	2.283

B = unstandardised coefficient; SE = standard error; CI = confidence interval; VIF = variance inflation factor. NLR = neutrophil-to-lymphocyte ratio; PLR = platelet-to-lymphocyte ratio.

Both ratios were statistically significant predictors within the exploratory binary logistic regression model. NLR had the larger standardised coefficient (β=0.561) compared with PLR (β=0.243). The variance inflation factor of 2.283 for both predictors did not suggest severe multicollinearity.

4.4 Diagnostic Accuracy: ROC Analysis

ROC curve analysis was performed for NLR, PLR and the combined regression-derived predicted value. All three showed high observed discrimination between septic and non-septic participants in this study sample; the estimates are presented in Table 6.

Table 6: Diagnostic accuracy of NLR, PLR and the combined regression-derived value by ROC analysis

Variable	AUC	SE	95% CI for AUC	z	p-value
NLR	0.991	0.00894	0.959–1.000	54.958	<0.001
PLR	0.955	0.0177	0.908–0.983	25.684	<0.001
Combined (NLR + PLR)	0.985	0.0105	0.950–0.998	46.039	<0.001

ROC = receiver operating characteristic; AUC = area under the curve; SE = standard error; CI = confidence interval. The combined variable is the predicted value derived from the binary logistic regression model in Table 5.

NLR had an AUC of 0.991 (95% CI 0.959–1.000), followed by the combined regression-derived value at 0.985 (95% CI 0.950–0.998) and PLR at 0.955 (95% CI 0.908–0.983). The exploratory combined model therefore did not improve discrimination beyond NLR alone.

The individual and combined ROC curves are shown in Figure 2.

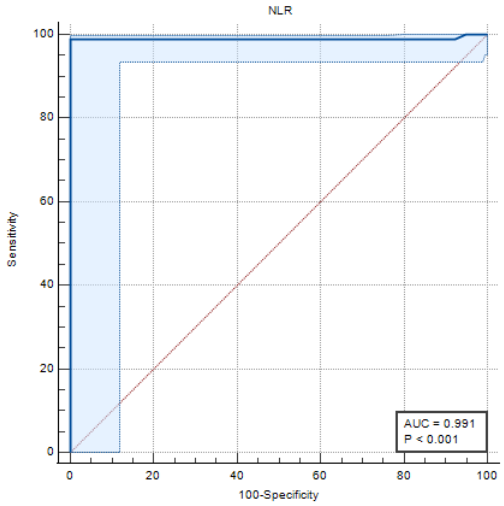

Fig. 2(a): ROC curve for NLR in the diagnosis of sepsis (AUC = 0.991, p<0.001). The shaded band represents the 95% confidence interval; the red diagonal is the line of no discrimination.

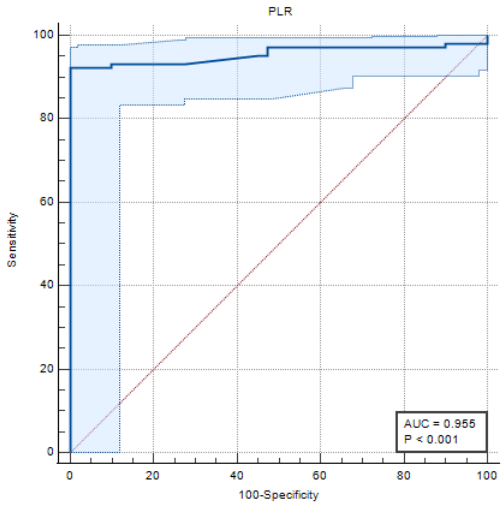

Fig. 2(b): ROC curve for PLR in the diagnosis of sepsis (AUC = 0.955, p<0.001).

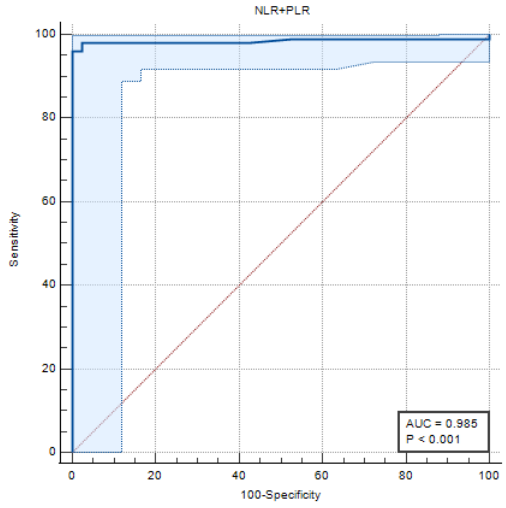

Fig. 2(c): ROC curve for the combined regression-derived NLR+PLR index in the diagnosis of sepsis (AUC = 0.985, p<0.001).

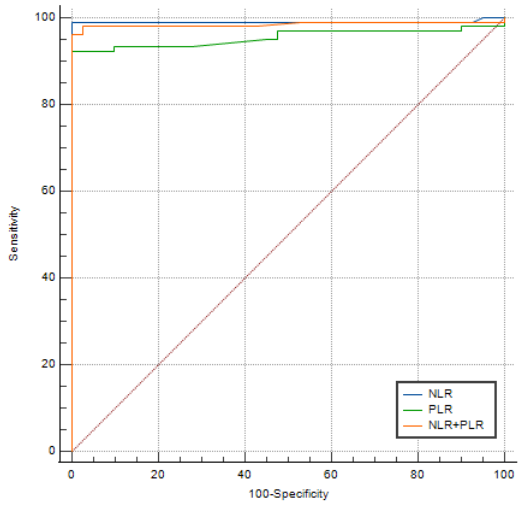

Fig. 2(d): Overlaid ROC curves comparing NLR, PLR and the combined NLR+PLR index.

Optimal cut-off values identified by maximising the Youden index, together with the corresponding diagnostic performance indices, are presented in Table 7.

Table 7: Optimal cut-off values and diagnostic performance indices

Variable	Cut-off	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)	Youden index
NLR	>2.3	99.05	100.00	100.00	97.56	99.31	0.991
PLR	>200	92.38	100.00	100.00	83.33	94.48	0.924
Combined (NLR + PLR)	>0.45	96.19	97.50	99.02	90.70	97.22	0.937

PPV = positive predictive value; NPV = negative predictive value. Cut-offs correspond to the maximum Youden index. For NLR and PLR the positive likelihood ratio is mathematically undefined because specificity was 100% in this sample. Diagnostic accuracy for the combined rule is calculated among the 144 participants with complete combined-model data (140/144=97.22%).

At a cut-off of >2.3, NLR correctly identified 99.05% of septic participants and none of the controls, giving an observed accuracy of 99.31%. PLR at a cut-off of >200 had 92.38% sensitivity and 100.00% specificity, with an observed accuracy of 94.48%. The combined regression-derived value at a cut-off of >0.45 had 96.19% sensitivity and 97.50% specificity; among the 144 participants with complete combined-model data, observed accuracy was 97.22%.

4.5 Classification Performance at the Derived Cut-offs

Cross-tabulation of study group against each classification rule is presented in Table 8. All three classifications were significantly associated with study group.

Table 8: Distribution of participants by study group according to NLR, PLR and combined classification

Classification	Category	Sepsis, n	Control, n	Total, n	χ^2 (df=1)	p-value
NLR	>2.3	104	0	104	140.116	<0.001
	≤2.3	1	40	41		
PLR	>200	97	0	97	111.627	<0.001

Classification	Category	Sepsis, n	Control, n	Total, n	χ^2 (df=1)	p-value
	≤200	8	40	48		
Combined	>0.45	101	1	102	121.882	<0.001
	≤0.45	4	39	43		

Pearson's chi-square test; Fisher's exact test p<0.001 for all three comparisons. For the combined classification, 144 participants had complete data; one participant had missing data. NLR = neutrophil-to-lymphocyte ratio; PLR = platelet-to-lymphocyte ratio.

Using the NLR rule, 104 of 105 septic participants and all 40 controls were correctly classified, yielding one false-negative result and no false positives. Using the PLR rule, 97 of 105 septic participants were correctly classified with no false positives, giving eight false-negative results. The combined rule correctly classified 101 septic participants and 39 controls, producing four false negatives and one false positive. These results should be interpreted as cohort-specific classification performance rather than as evidence that NLR can independently diagnose sepsis in routine practice.

V. DISCUSSION

This study evaluated the observed diagnostic discrimination of two composite indices derived from a routine complete blood count in distinguishing adult patients with sepsis from non-septic controls. Both NLR and PLR were significantly higher in the sepsis group. An NLR threshold of >2.3 yielded 99.05% sensitivity and 100.00% specificity in this cohort, with an observed accuracy of 99.31%.

5.1 Interpretation of the Component Counts

An important and somewhat unexpected observation is that the absolute lymphocyte count did not differ significantly between the sepsis and control groups (2099.05 ± 526.69 versus 2007.50 ± 483.78 per µL; p=0.341). Much of the published literature emphasises sepsis-induced lymphopenia, arising from accelerated apoptosis of circulating lymphocytes, as a central contributor to the elevation of NLR. In the present cohort, the elevation of NLR was instead driven almost entirely by neutrophilia, the mean absolute neutrophil count in the sepsis group being more than twice that of controls.

A parallel observation applies to PLR. The higher platelet count observed in the sepsis group may be compatible with a reactive inflammatory response; however, the present study cannot establish the underlying mechanism.

This observation indicates that, in this cohort, the observed elevation of NLR and PLR was driven mainly by the numerator rather than by a measurable difference in lymphocyte count. The ratios may therefore provide limited information beyond the component counts in this particular sample; their incremental value should be tested in larger, clinically representative cohorts.

5.2 Comparison with Published Cut-off Values

The NLR cut-off of 2.3 derived in the present study is lower than thresholds reported in several prognostic sepsis studies. This difference is expected because prognostic thresholds are generally derived within already septic populations, whereas the present threshold was derived to distinguish septic from non-septic participants. The control group in this study had a mean NLR of approximately 2.0 and did not include patients with non-septic systemic inflammation. [5,6,7,9,13]

The AUC values obtained here — 0.991 for NLR and 0.955 for PLR — are high. However, they may overestimate performance in clinical practice because the comparator group did not include patients with non-septic systemic inflammation, such as postoperative or trauma patients, in whom neutrophilia may also occur. The separation between the study groups is therefore likely to be greater than in an undifferentiated population with suspected infection. The reported estimates should consequently be interpreted as cohort-specific rather than as estimates of real-world diagnostic performance. [6,9,12]

5.3 Relationship with qSOFA Category

Neither ratio showed a significant association with qSOFA category. NLR was numerically lower in participants with qSOFA 2–3 than in those with qSOFA 1, approaching but not attaining conventional statistical significance (p=0.051), while PLR was essentially unchanged. The limited number of participants with qSOFA 2–3, particularly the very small number with a score of 3, reduces statistical power for detecting a gradient. [14]

In this cohort, NLR and PLR were associated with the presence of sepsis but were not associated with qSOFA category. They should therefore not be interpreted as substitutes for clinical assessment, SOFA-based organ-dysfunction assessment, or other validated risk-stratification approaches. [3,14]

5.4 Value of Combining the Two Ratios

The exploratory combined regression-derived index did not outperform NLR alone, achieving a slightly lower AUC (0.985 versus 0.991) and introducing one false-positive classification that NLR alone avoided. Given the strong intercorrelation between the two ratios (r=0.750), the finding is plausible, but it should not be considered definitive because the composite was generated using ordinary logistic regression with a binary outcome and was evaluated in the same dataset from which it was derived. NLR demonstrated numerically greater observed discrimination than PLR in this cohort: however formal statistical comparison of the correlated AUCs was not performed.

5.5 Limitations

Several limitations should be acknowledged. The study was conducted at a single centre with a modest sample size and an unequal group allocation, which limits generalisability. The control group comprised non-septic participants without an intermediate comparator of patients with non-septic systemic inflammation, and this design can inflate apparent discriminative performance because of spectrum bias. Sampling was performed at a single time point, so the trajectory of the two ratios over the course of illness was not assessed. No clinical outcome data, including mortality, length of stay or requirement for organ support, were collected, so

the prognostic value of the ratios in this population remains undetermined. NLR and PLR were not compared against established biomarkers such as C-reactive protein, procalcitonin or lactate, so their incremental value over existing tests cannot be quantified.

VI. CONCLUSION

In this hospital-based comparative study of 145 adult participants, NLR and PLR were significantly higher in patients with sepsis than in non-septic controls. NLR showed greater observed discrimination than PLR in this cohort, while the exploratory combined NLR–PLR model did not improve discrimination beyond NLR alone. Neither ratio was significantly associated with qSOFA category. These findings support further prospective evaluation of NLR and PLR as adjunctive laboratory markers rather than stand-alone diagnostic tests.

Because both indices are derived from a complete blood count already obtained in routine care, they may be useful as adjunctive laboratory markers. The high accuracy observed here should be interpreted in light of the comparator design and the absence of patients with non-septic systemic inflammation Prospective multicentre studies enrolling undifferentiated patients with suspected infection, incorporating serial sampling, clinical outcome follow-up, direct comparison with established biomarkers, and appropriate logistic modelling with validation are required before NLR or PLR can be considered for routine diagnostic use. Current sepsis guidance emphasises that no single biomarker or diagnostic test should be used in isolation to rule in or rule out sepsis. [3]

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